

# LETTER TO PARENTS

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*Cut here and paste on school letterhead before making copies.*

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## SCIENCE NEWS

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Dear Parents,

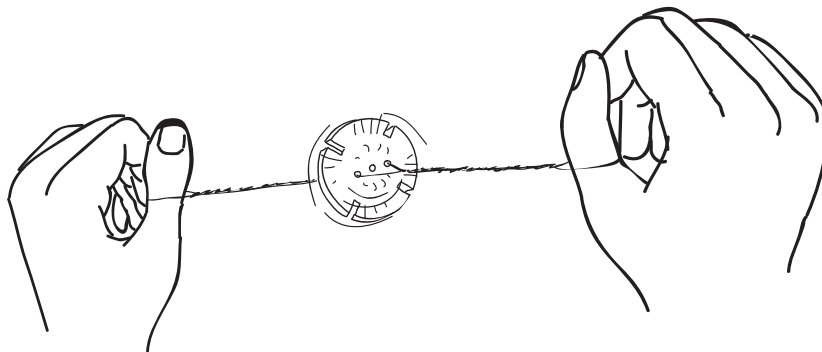
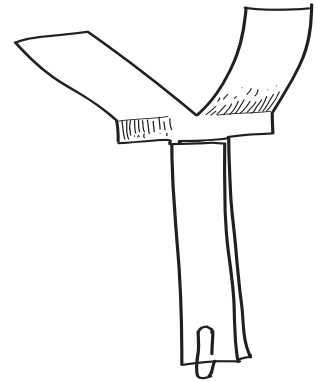
Balance and Motion is the new unit we are studying in science. We will be observing and comparing how objects balance, spin, and roll, and communicating orally and in writing the things we discover. The processes of observing, communicating, and comparing are important thinking processes that your child will be using during our investigation of these interesting characteristics of objects and systems.

Your child may be interested in trying some things at home. You might want to tie a string between two chairs and see how many paper cups, craft sticks, and other objects you can balance (use clothespins for counterweights). You could make a big mobile by suspending a broomstick and hanging things from it, or make spinning tops out of Tinkertoys™ or other shafts and hubs. Check your local toy store for tops and other spinners. The possibilities are endless, and your child can be your guide.

We're looking forward to our new unit on balance and motion to provide lots of learning and lots of fun!

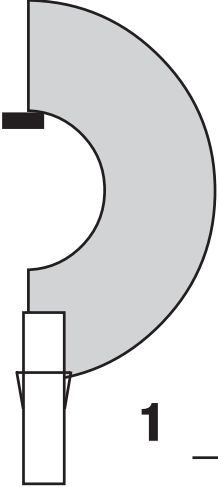
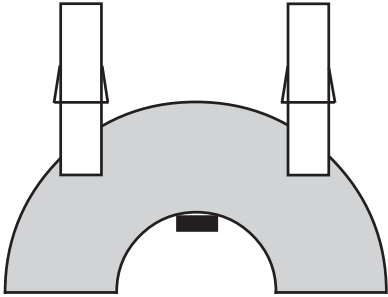
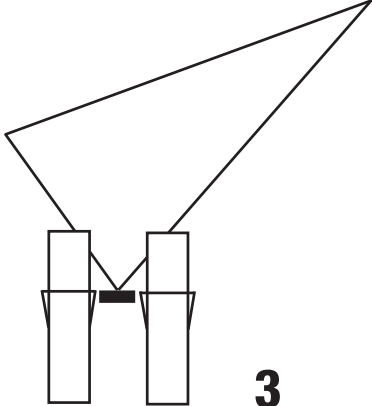
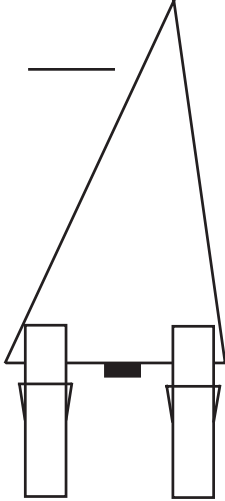
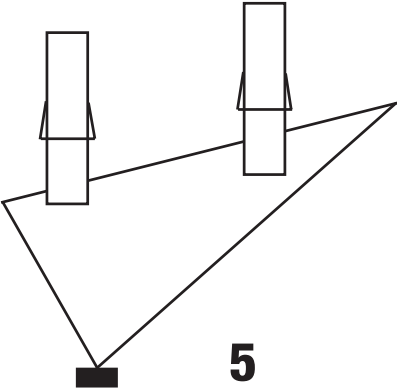
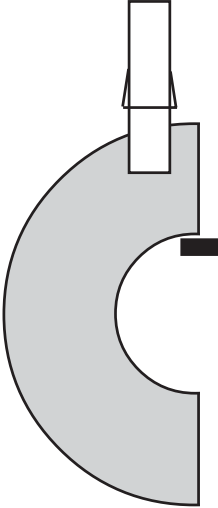
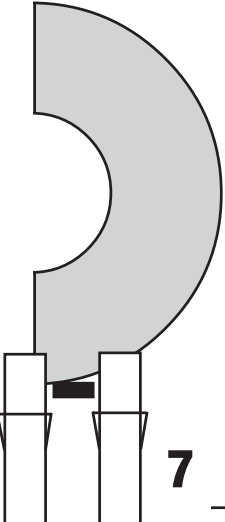
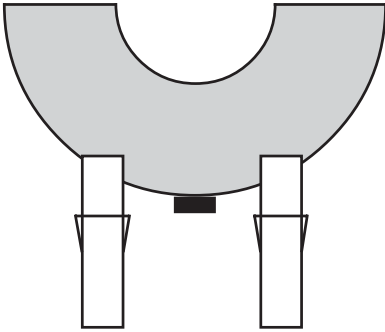
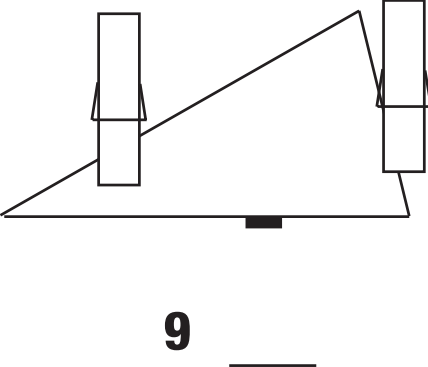
Sincerely,

\_\_\_\_\_



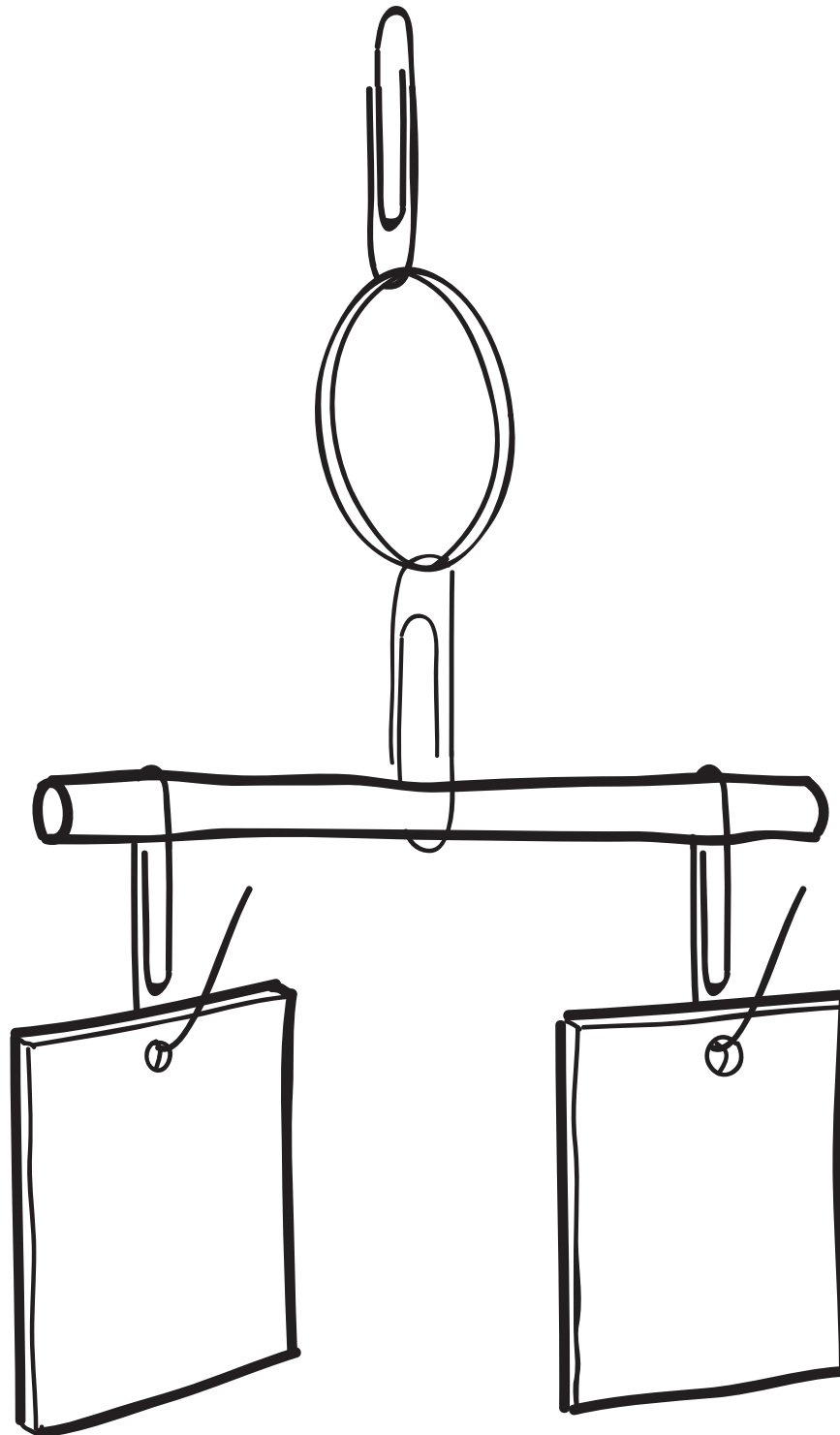
# STABLE POSITIONS

Look at each picture. Does it show a stable position?

 <p><b>1</b> _____</p>	 <p><b>2</b> _____</p>	 <p><b>3</b> _____</p>
<p><b>4</b> _____</p> 	 <p><b>5</b> _____</p>	 <p><b>6</b> _____</p>
 <p><b>7</b> _____</p>	 <p><b>8</b> _____</p>	 <p><b>9</b> _____</p>

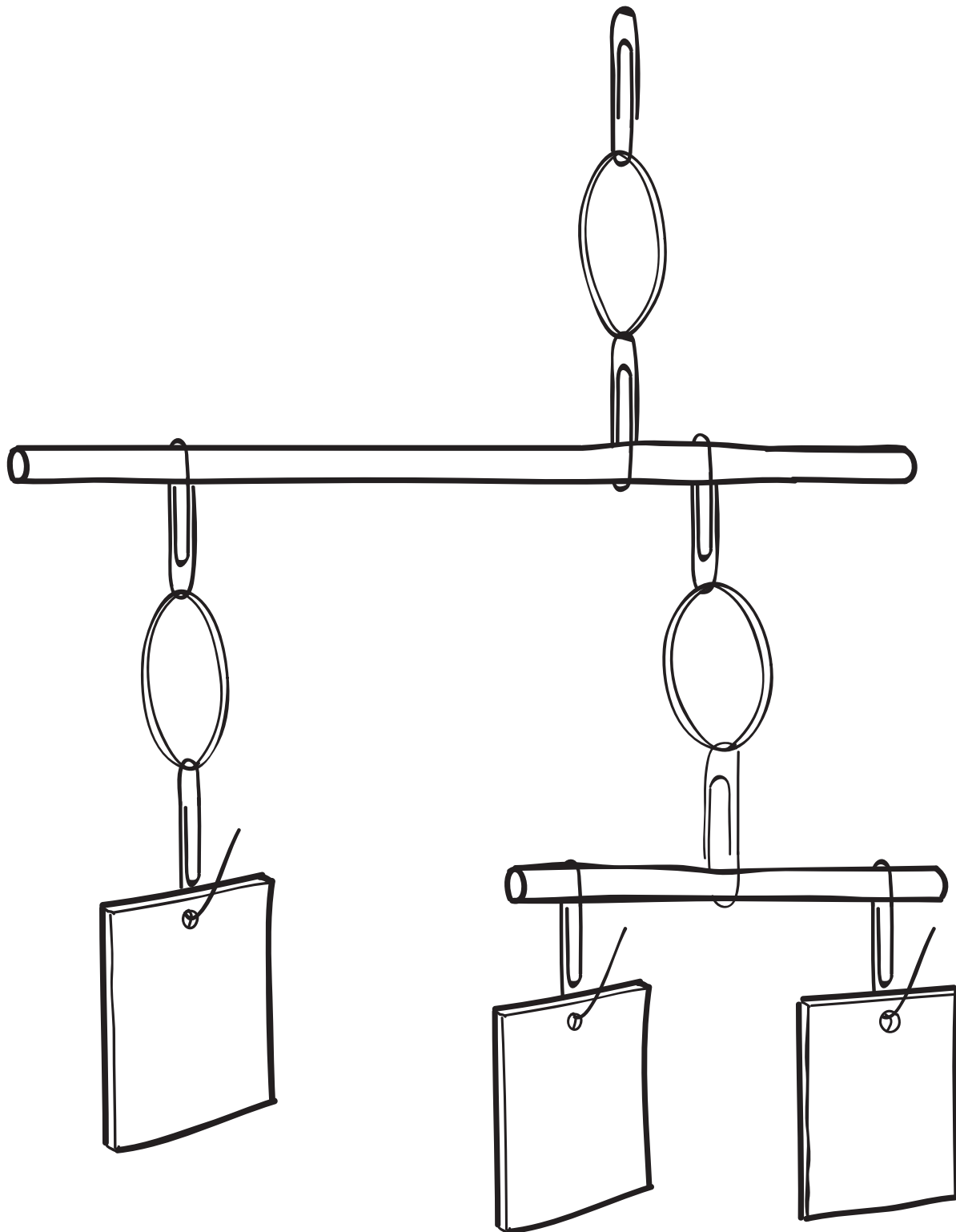
# MOBILE 1 POSTER

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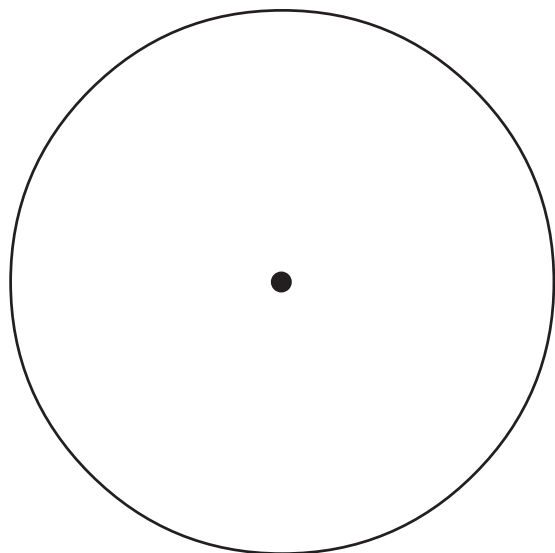
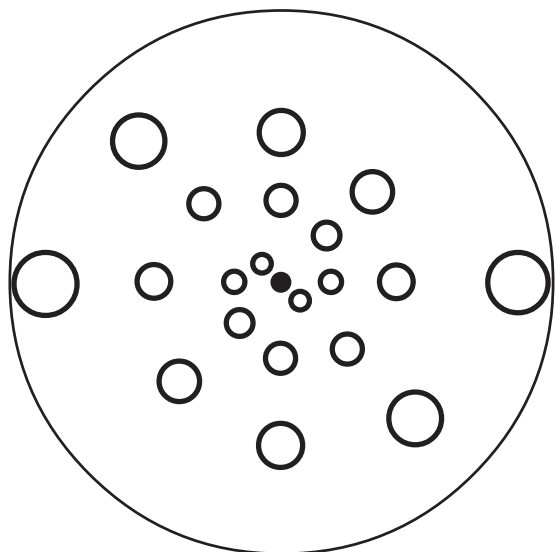


# MOBILE 2 POSTER

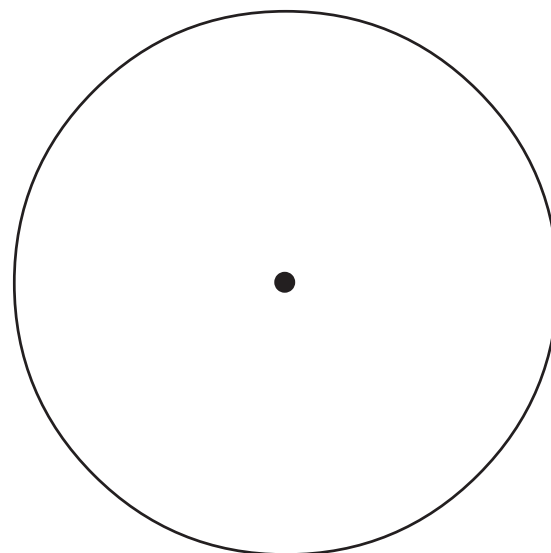
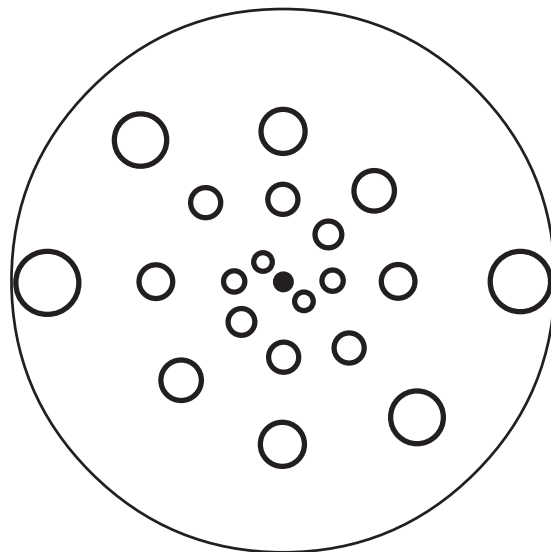
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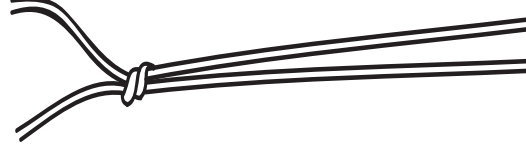
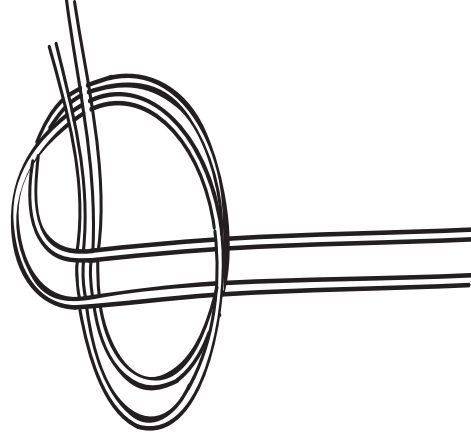
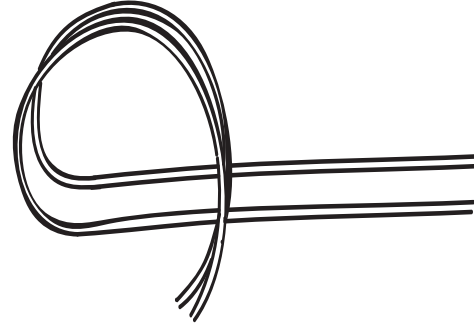
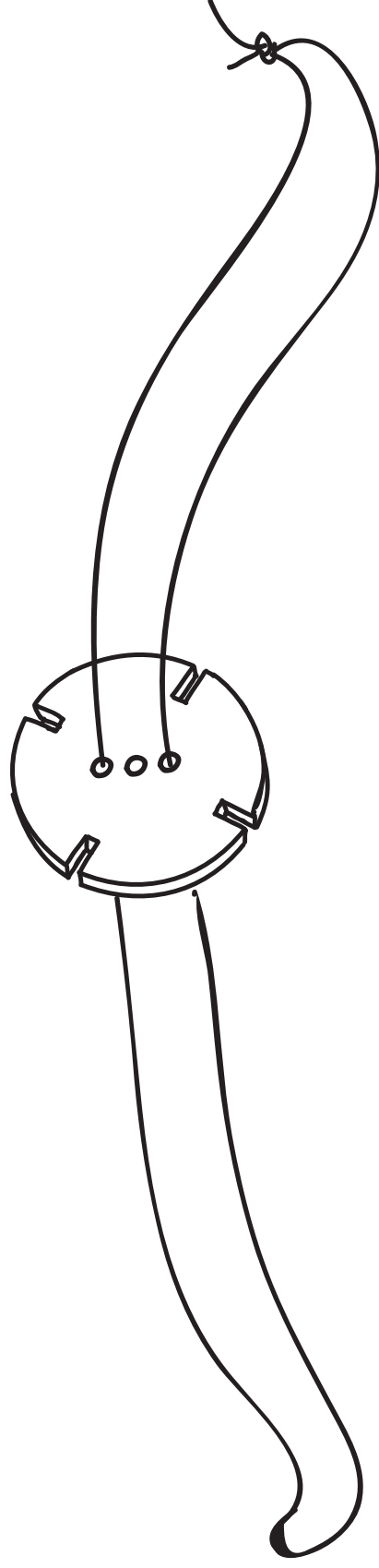
## SPINNING DESIGNS.....



## SPINNING DESIGNS.....



# ZOOMER.....



**TWIRLER WINGS** .....

**TWIRLER WINGS** .....

**TWIRLY BIRD**

.....

**TWIRLY BIRD**

.....

**TWIRLY BIRD**

.....

**TWIRLY BIRD**

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# CENTER INSTRUCTION CARD—VIBRATIONS

## INVESTIGATION 2: SPINNERS

### MAKE A DOOR FIDDLE

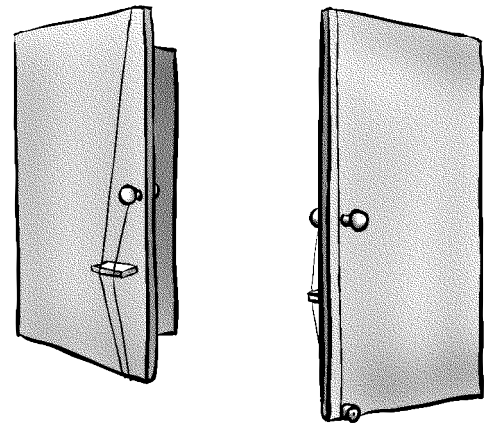
Have students set up a door fiddle. When they pluck its strings, they can observe relationships between the motion of the string (vibrations), the pitch of the sound produced, and the volume of the sound.

### MATERIALS

- 1 Heavy-duty cord, 6 m (20')
- 1 Large wooden bead (or other small object that can't fit under the door)
- 1 Wood block, 2 cm × 9 cm × 23 cm (1" × 4" × 9")

### SET UP THE CENTER

1. Find a door with a knob.
2. Tie the bead to the end of the cord. Slide the cord under the door about 15 cm (6") from the edge. Pull the bead up snug behind the door.
3. Loop the cord over the top of the door. Go behind the door, and pull the cord down tightly. Slide the cord under the door again, this time about 10 cm (4") from the edge. Pull up on the cord. Work with both hands to make the cord tight; pull up on the cord in front while pulling down on the cord in back.
4. Wrap the remaining length of cord tightly around the doorknob and tie it off.
5. Slide the piece of wood flat under the strings below the knot. Stand it up. The fiddle is now tuned and ready.



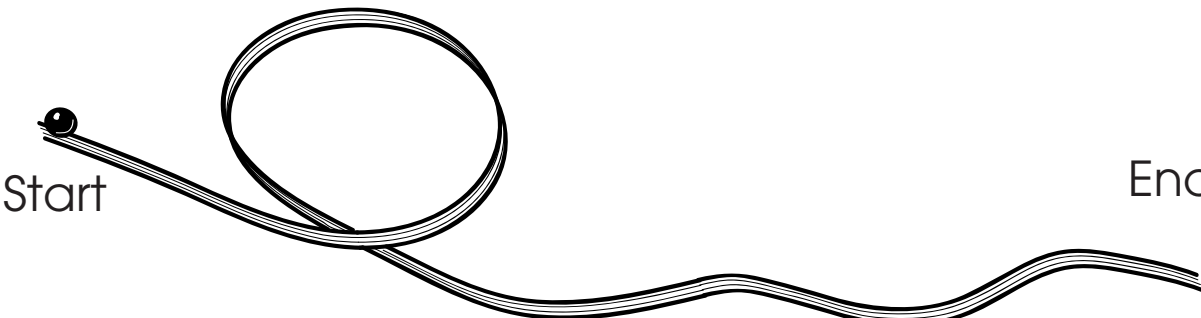
### GUIDE THE ACTIVITY

1. Pluck the cord somewhere between the top of the door and the wood block. Discuss the motion of the string—note how the string moves back and forth. Tell students when something moves back and forth, we say that it is **vibrating**. Vibrations produce sound.
2. When students work at the center, they can explore the motion of all the cords on the door fiddle. Challenge them to make the pitch higher and the volume louder.
3. After all students have had a chance to work with the door fiddle, establish these ideas.
  - a. The shorter the length of the cord, the faster it moves, and the higher the pitch.
  - b. The more force you use to set the cord in motion, the louder the volume.

Name \_\_\_\_\_ Date \_\_\_\_\_

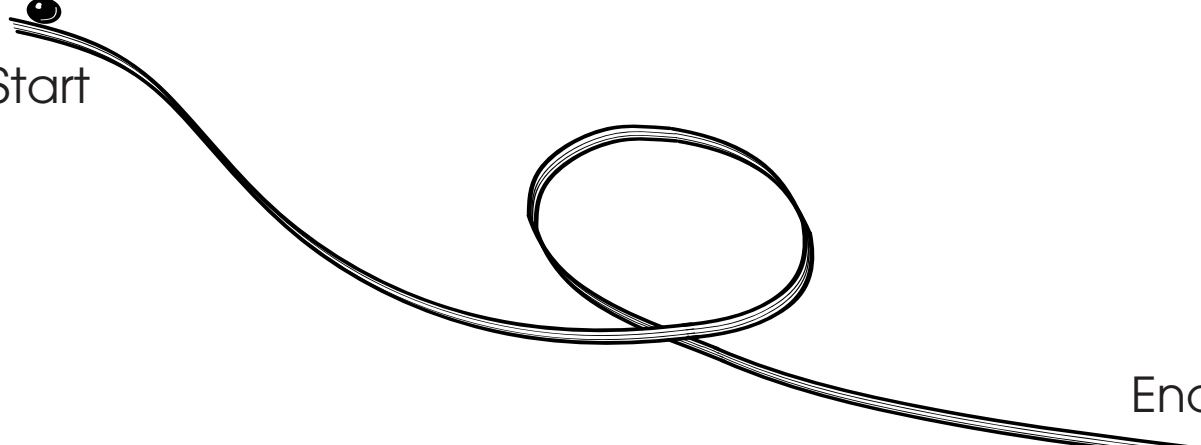
## MARBLE RUNWAYS

Will a marble roll all the way through the runway?



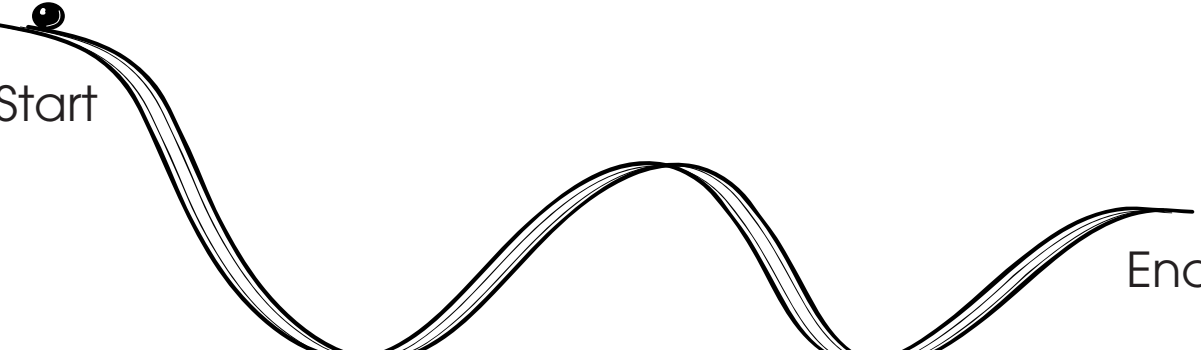
A diagram of a marble runway. It starts with a marble at a point labeled "Start". The track goes up a slight incline, forms a large loop, and then continues as a wavy line towards a point labeled "End".

☐ Yes    ☐ No (Circle the place the marble will stop.)



A diagram of a marble runway. It starts with a marble at a point labeled "Start". The track goes down a steep incline, forms a loop, and then continues as a slight upward incline towards a point labeled "End".

☐ Yes    ☐ No (Circle the place the marble will stop.)



A diagram of a marble runway. It starts with a marble at a point labeled "Start". The track goes down a steep incline, followed by a series of three connected hills and valleys, ending at a point labeled "End".

☐ Yes    ☐ No (Circle the place the marble will stop.)

# CENTER INSTRUCTION CARD—MAGNETIC FORCE

## INVESTIGATION 3: ROLLERS

### MATERIALS

- Donut-shaped magnets
- Sheets of cardboard

### GUIDE THE ACTIVITY

Donut-shaped magnets will roll down inclined surfaces when they are released, or across level, flat surfaces if they are given a little push (a force is applied). What happens, however, when two magnets approach one another while one (or more) is rolling can be very entertaining and instructional. In this guided inquiry students will discover that magnets can exert a push force or a pull force on one another, depending on the orientation of the magnets. Provide these challenges to students.

1. Set up a cardboard ramp so it is on a gentle slope. Place some magnets at the bottom of the slope. Roll magnets down the slope and observe what happens. Tell how the magnetic force affects movement.
2. Set up two cardboard ramps facing each other. Roll magnets down the slopes toward each other. Tell how the magnetic force affects movement.
3. Place several magnets on a table. Cover them with a sheet of cardboard. Roll magnets across the cardboard and observe what happens.
4. Try a rolling, spinning, or swinging investigation of your own, using magnets. Tell how the magnetic force affects movement.

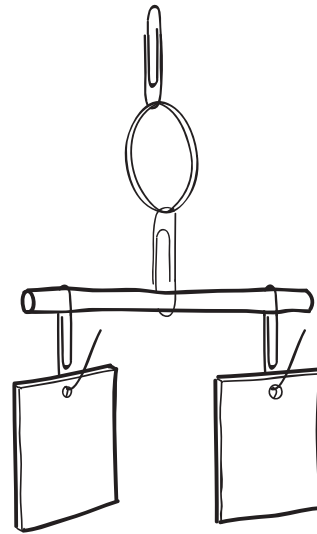
A force is a push or a pull. Do magnets push or pull? Why do you think so?

Name \_\_\_\_\_ Date \_\_\_\_\_

## MATH EXTENSION A

### INVESTIGATION 1: BALANCE

Jill, Joy, Randy, and Roy each made a mobile like this one. →



How many rubber bands did they use? \_\_\_\_\_

How many straws did they use? \_\_\_\_\_

How many cards did they use? \_\_\_\_\_

How many paper clips did they use? \_\_\_\_\_

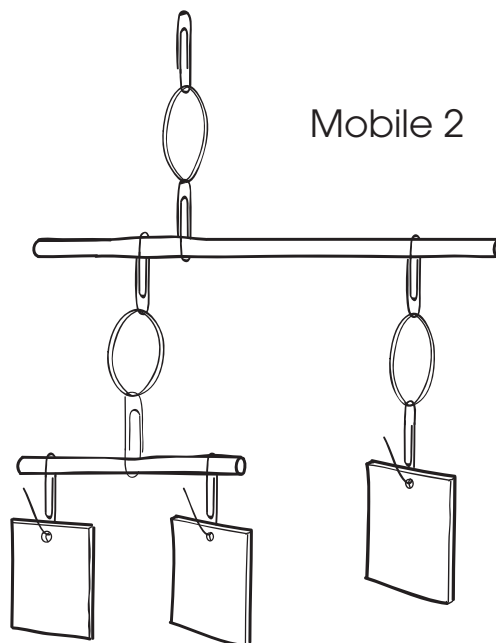
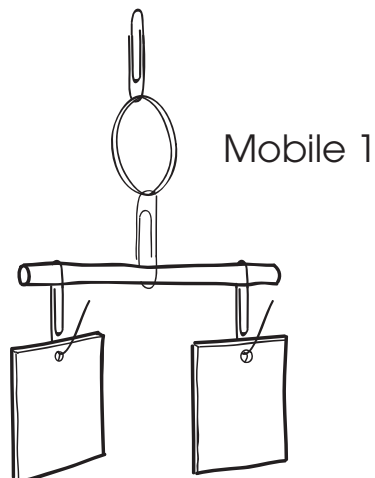
Name \_\_\_\_\_ Date \_\_\_\_\_

## MATH EXTENSION B

### INVESTIGATION 1: BALANCE

Ms. Giffin's class has 20 students. Half the class decided to make mobile 1, and half the class decided to make mobile 2.

How many straws, paper clips, rubber bands, and cards did she need to have ready for all the students to make a mobile?



Name \_\_\_\_\_ Date \_\_\_\_\_

## MATH EXTENSION A

### INVESTIGATION 2: SPINNERS

#### INVENT A TOP !

Choose a shaft  
from this group.

5¢   
Short

10¢   
Medium

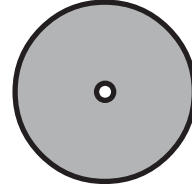
25¢   
Long

Choose one or more  
disks from this group.

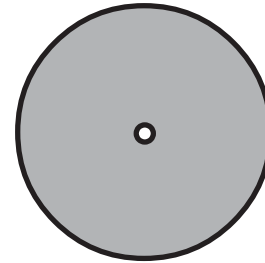
5¢ Small



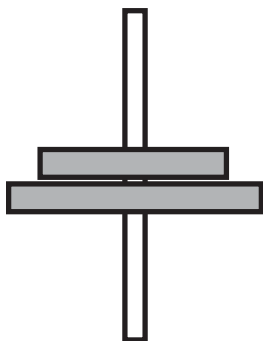
10¢ Medium



25¢ Large



Draw a new top.  
What will the top  
cost? Example:



25¢  
10¢  
+10¢  
45¢

Draw a top that  
will cost \$1.00.

Name \_\_\_\_\_ Date \_\_\_\_\_

## MATH EXTENSION B

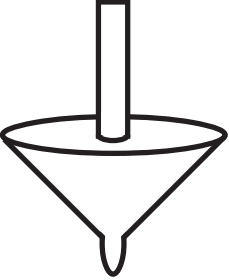
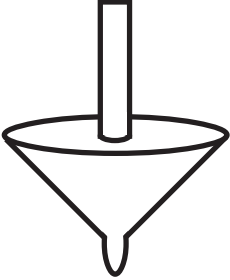
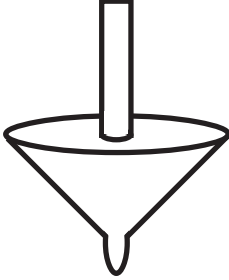
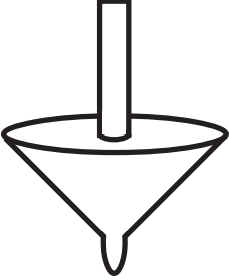
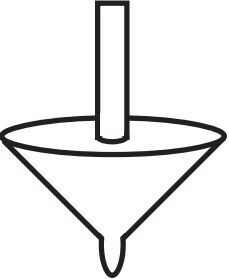
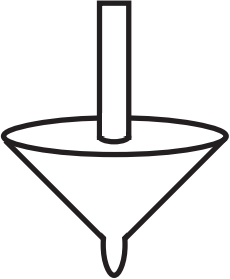
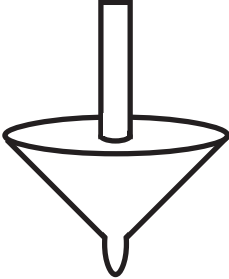
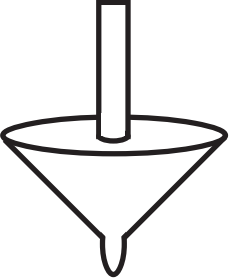
### INVESTIGATION 2: SPINNERS

Top Lineup!

Color the tops on the cards below. Cut the eight cards apart on the dashed lines.

As your teacher reads the clues, line up the tops according to what each clue tells you.

Compare your lineup with a partner's and see if you agree.

 red	 blue	 green	 yellow
 red	 blue	 green	 yellow

# MATH EXTENSION B—TEACHER SHEET

## INVESTIGATION 2: SPINNERS

### Top Lineup!

This math extension requires students to use logic and understanding of position to put tops in the order suggested by the clues. After students have colored and cut apart the top cards, read each set of clues and have students line up the tops. Pause after each clue long enough for students to rearrange their tops.

#### Top Lineup 1

Clue 1—There are five tops in a line.  
(No action needed.)

Clue 2—Two tops are red. Two tops are blue. One top is green.  
(Students select tops from total group.)

Clue 3—A red top is in the front of the line. Two blue tops are at the end of the line.  
(Students line up a red top in front, place two blue tops at the end, leaving space for tops that will go in between.)

Clue 4—A red top is in the middle of the line.  
(Students decide where to place the final two tops that are red and green.)

Answer from front to back of the line: Red, green, red, blue, blue.

#### Top Lineup 2

Clue 1—There are two red tops, two blue tops, two green tops, and two yellow tops.

Clue 2—One blue top is first in line. One blue top is last in line.

Clue 3—Two red tops are just in front of two yellow tops.

Clue 4—One green top is just behind two yellow tops in the line.  
One green top is just in front of two red tops in the line.

Answer from front to back of the line: Blue, green, red, red, yellow, yellow, green, blue.



Name \_\_\_\_\_ Date \_\_\_\_\_

## **MATH EXTENSION A**

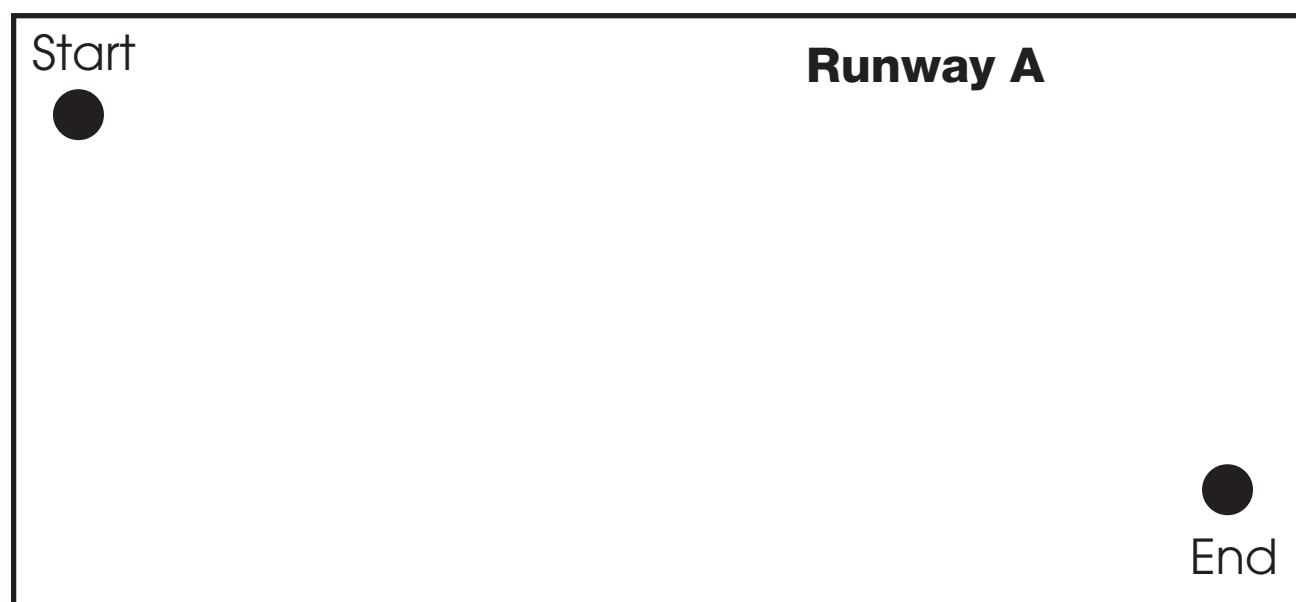
### **INVESTIGATION 3: ROLLERS**

Draw two runways that a marble might roll through from top to bottom.

Which one do you think is longer? \_\_\_\_\_

Can you prove it?

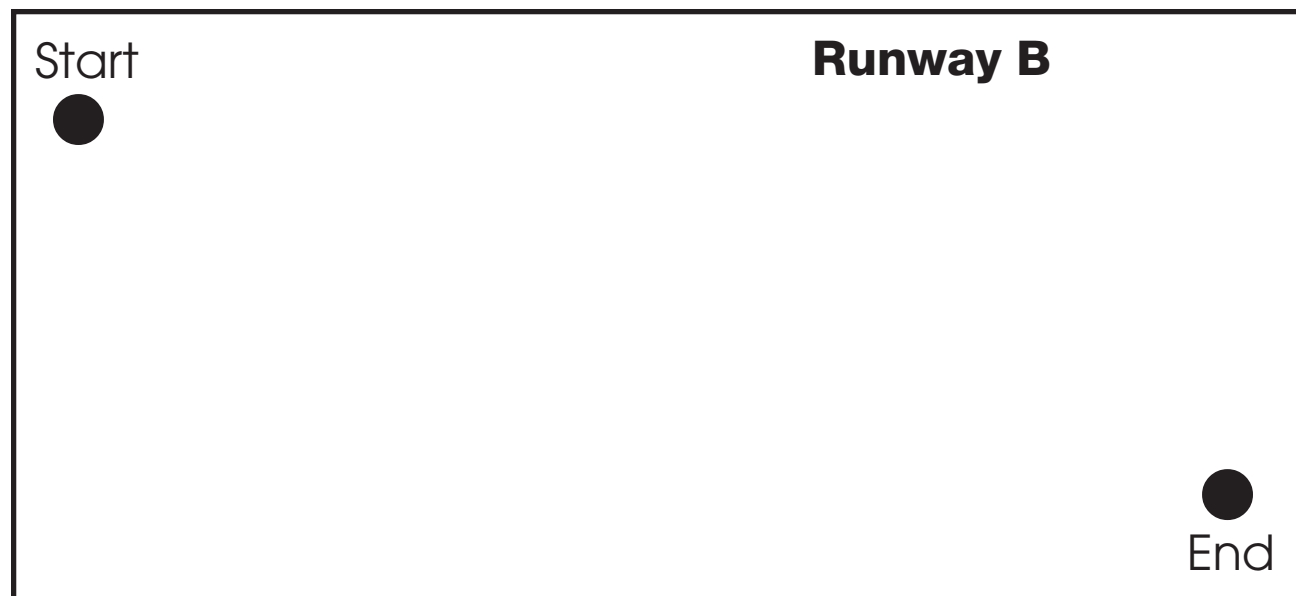
Start



**Runway A**

End

Start



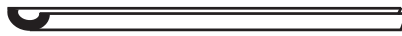
**Runway B**

End

Name \_\_\_\_\_ Date \_\_\_\_\_

## MATH EXTENSION B

### ..... **INVESTIGATION 3: ROLLERS**



Which runway pieces above can be used to make the long runway shown below?

How many different ways can you make the long runway?



# HOME/SCHOOL CONNECTION

## INVESTIGATION 1: BALANCE

Dear Parents,

In class, we have been exploring balance. We've learned how to balance all kinds of shapes by adding clothespins, which act as counterweights. Here are some fun movements to explore together and some questions to ask your child that might lead to interesting discussions about balance, weight, and counterbalance.

Try this!

- Compare standing on one foot with your eyes closed and with your eyes open.

Which is easier? Why do you think that might be?

- Compare standing on one foot, standing on two feet, and sitting on the floor.

Which do you think is the most stable—easiest to maintain balance without falling over? Why do you think that might be so?

- Stand with your heels against a wall. Now bend over to pick up an object on the floor.

What happens? Why do you think it happens?

- Try to get up from a chair without moving your hands or leaning. What happens? What do you need to do to get up?



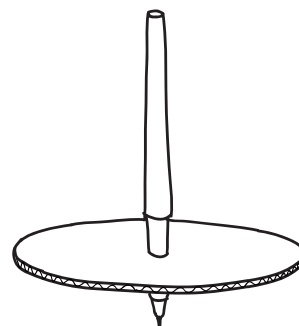
# HOME/SCHOOL CONNECTION

## INVESTIGATION 2: SPINNERS

**ZOOMERS:** Traditional zoomers are made from a button and a piece of string. The string is strung through the button holes and tied to make a loop. When you twirl it around to put a twist in the string and pull it tight to unwind, the button will spin.



**TOP:** Cut a 13- or 15-cm (5- or 6-inch) circle from a piece of cardboard. Poke a hole in the center big enough for a pencil or felt-tipped pen.



Some things to try

- Add more cardboard disks to the top.
- Compare zoomers made with a big and a little button.
- Add a spinning design to a top or zoomer.

(The best way to see the spinning design on a zoomer is to reorient the zoomer by bringing one hand in front of your face and moving the other hand away from you. Make the zoomer go fast or slow and watch the design change.)

- Make tops from different materials.
- Try anything you can think of—be curious!

What did you make?

What did you try?

What happened?

Name \_\_\_\_\_ Date \_\_\_\_\_

## HOME/SCHOOL CONNECTION

### INVESTIGATION 3: ROLLERS

Look for things that roll or spin in your home or neighborhood. Rollers and spinners might be found in any room of the house, in a tool box, in a toy box, or outside. Two examples are given to start off your hunt.

#### Rollers

car wheels

#### Spinners

water going down the drain